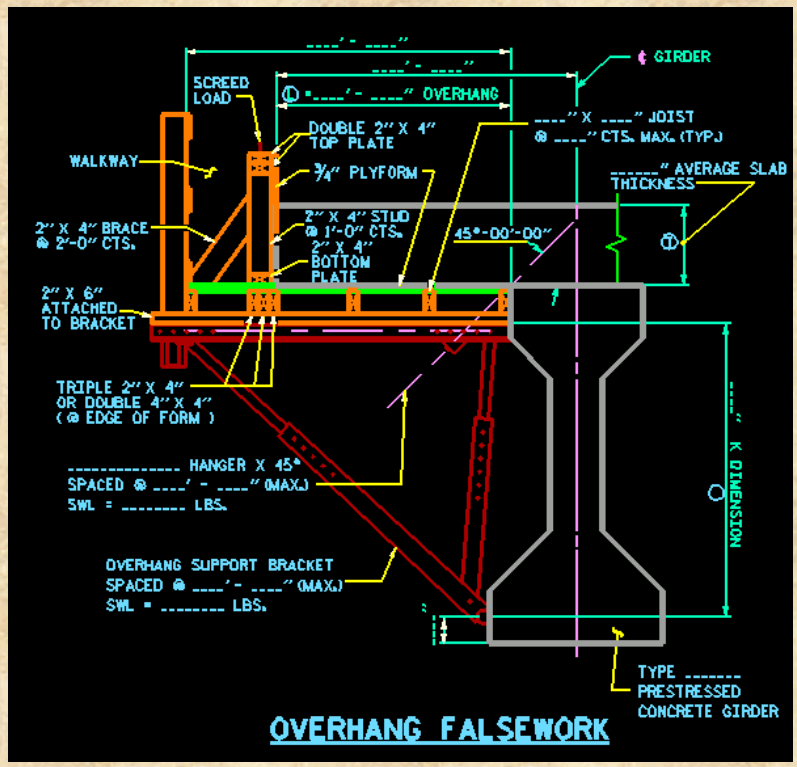
Utilizing the Standard Overhang Falsework Design Sheets

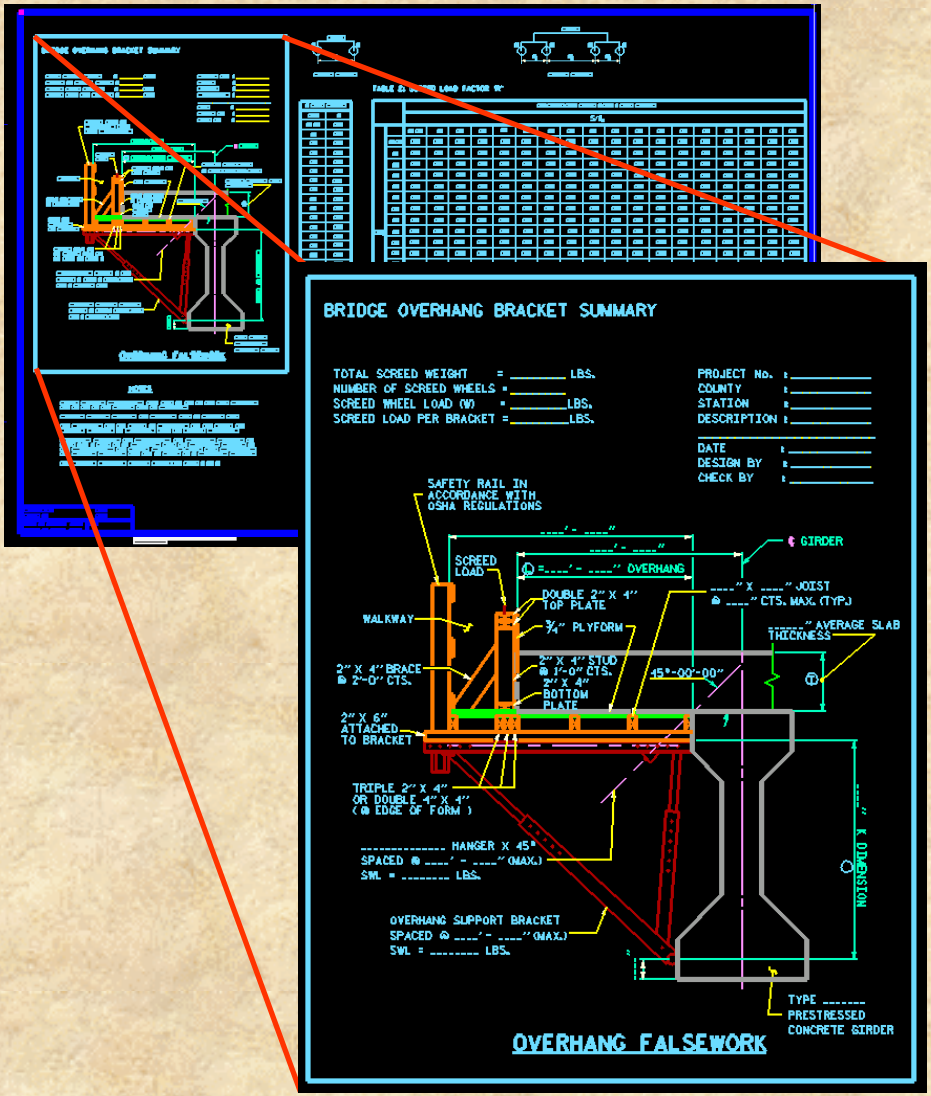
(NCDOT CPI Award - 2006)

Introduction

- To reduce number of submittals and associated costs, NCDOT has developed a standardized method for determining overhang falsework bracket spacing.
- Contractors still have the option to submit their own design.



Initial Data



- Record known information (screed weight, No. of screed wheels, screed wheel load, avg. overhang slab thickness, etc) on the overhang falsework summary sheet.
- Note the Screed Wheel Load, W
- Use an initial guess for the Screed Load Factor, R = 1.5.
- Make and initial estimate of the Screed Load per Bracket, SLPB = R x W.

Bracket Spacing

- Based on the overhang width, select the appropriate table (Tables 1-4) on sheet 1.
- From the selected table, use the overhang bracket, K, dimension, the overhang thickness, T, and the SPLB to determine a bracket spacing, S.

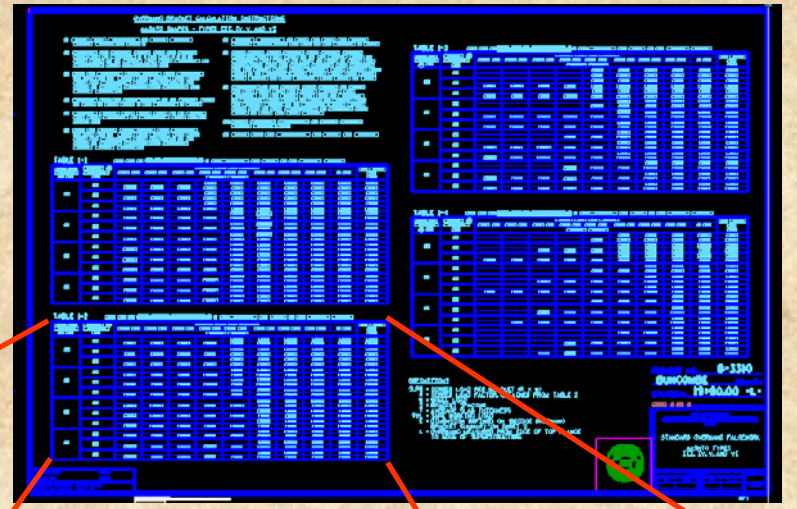
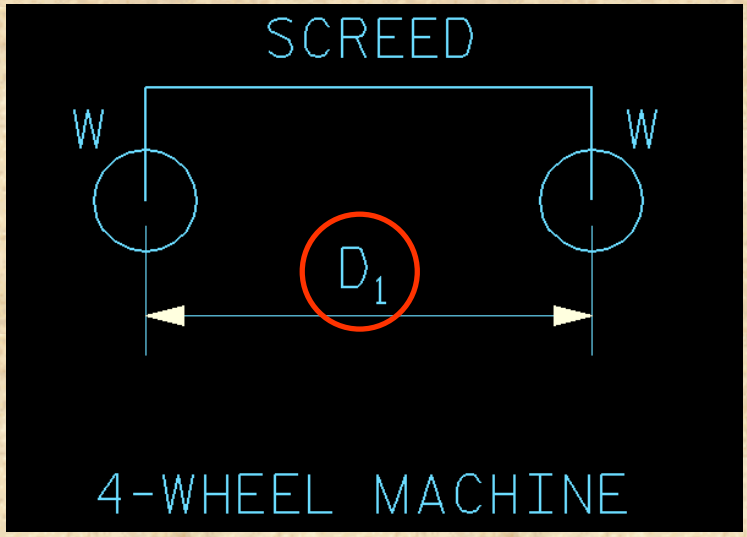


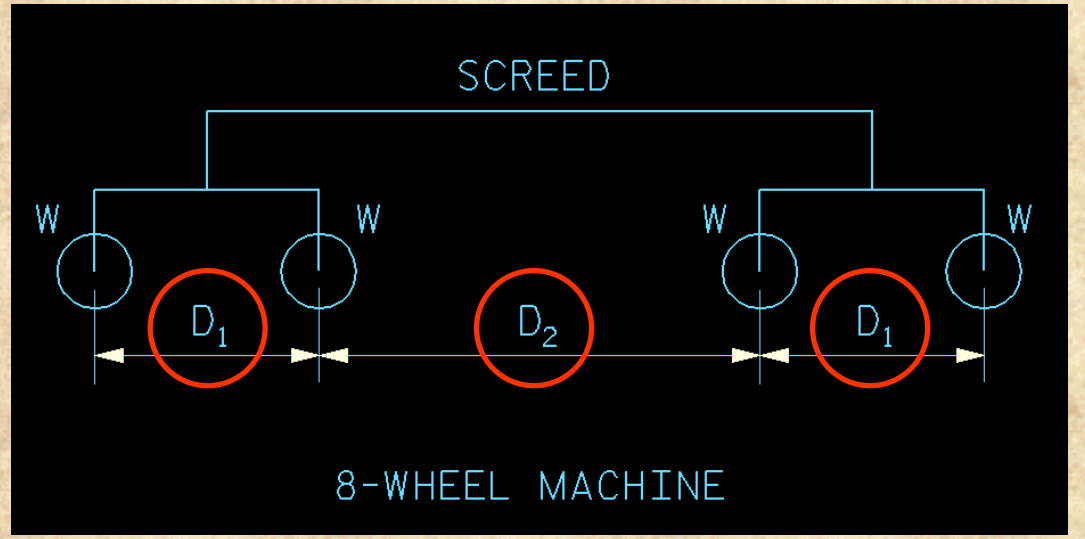
TABLE 1-1 (FOR USE ON [illegible] & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (T) (in)	BRACKET (K) DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
					4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
					4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
					4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30	3'-2"	[illegible]	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"		4000
					4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	40	[illegible]	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"		4000
					4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	50	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"		4000
					4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
14	30	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"		4000
					4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	40	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"		4000
					4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	50	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"		4000
					4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
16	30	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"		4000
					3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	40	2'-8"	3'-0"	3'-6"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"		4000
					3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	50	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"		4000
					3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000

Screed

- Calculate the ratio S/D_1 and/or S/D_2, rounding up to the nearest value in Table 2 (see sheet 2)





Screed Load Factor (R)

- Use the S/D1 and/or the S/D2 ratio to update the Screed Load Factor, R, from Table 2.
- Repeat the previous steps until the the revised overhang bracket spacing, S, is the same as the previous value.

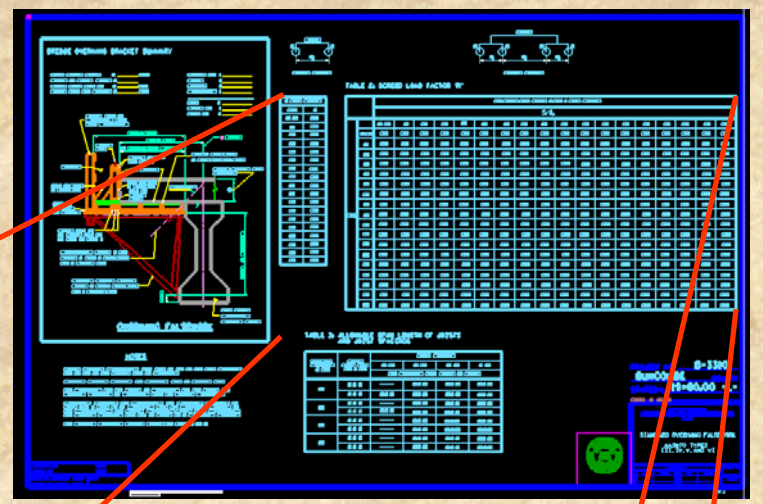


TABLE 2: SCREED LOAD FACTOR "R"

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.35
1.6	1.39
1.7	1.4
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.59
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75

THE SCREED LOAD FACTOR R FOR 6 WHEEL MACHINE																		
	S/D2																	
S/D1	<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.59	1.62	1.64	1.67	1.71	1.75
1.1	1.09	1.15	1.20	1.26	1.32	1.36	1.42	1.47	1.50	1.54	1.56	1.60	1.64	1.67	1.71	1.73	1.76	1.80	1.84
1.2	1.17	1.20	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.86	1.92
1.3	1.23	1.26	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.66	1.70	1.73	1.76	1.78	1.81	1.85	1.87	1.90	1.95	1.98
1.4	1.29	1.32	1.38	1.46	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
1.5	1.35	1.38	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.86	1.92	1.95	1.98	2.00	2.10	2.17
1.6	1.39	1.41	1.47	1.54	1.61	1.66	1.71	1.75	1.78	1.82	1.85	1.88	1.92	1.95	1.98	2.04	2.08	2.18	2.26
1.7	1.40	1.44	1.50	1.58	1.64	1.70	1.73	1.78	1.82	1.86	1.89	1.91	1.95	1.98	2.01	2.06	2.12	2.21	2.30	2.32
1.8	1.44	1.47	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.98	2.01	2.04	2.09	2.15	2.24	2.33	2.38
1.9	1.47	1.50	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.01	2.04	2.07	2.11	2.18	2.27	2.36	2.45
2.0	1.50	1.52	1.57	1.65	1.73	1.79	1.83	1.88	1.92	1.95	1.97	2.00	2.04	2.07	2.09	2.14	2.21	2.30	2.39	2.50
2.2	1.55	1.57	1.62	1.70	1.77	1.83	1.88	1.92	1.95	1.98	2.01	2.04	2.08	2.11	2.14	2.19	2.26	2.35	2.44	2.55
2.4	1.59	1.61	1.66	1.73	1.80	1.86	1.91	1.95	1.98	2.01	2.04	2.08	2.12	2.15	2.18	2.23	2.30	2.39	2.48	2.59
2.6	1.62	1.64	1.69	1.77	1.83	1.89	1.94	1.98	2.01	2.04	2.07	2.11	2.15	2.18	2.21	2.26	2.33	2.42	2.51	2.62
2.8	1.64	1.67	1.71	1.80	1.86	1.92	1.97	2.01	2.04	2.07	2.10	2.14	2.18	2.21	2.24	2.29	2.36	2.45	2.54	2.65
3.0	1.67	1.69	1.74	1.82	1.89	1.95	2.00	2.04	2.07	2.10	2.13	2.17	2.21	2.24	2.27	2.32	2.39	2.48	2.57	2.68
3.5	1.71	1.73	1.78	1.86	1.93	1.99	2.04	2.08	2.12	2.15	2.18	2.22	2.26	2.29	2.32	2.37	2.44	2.53	2.62	2.73
4.0	1.75	1.77	1.82	1.90	1.97	2.03	2.08	2.12	2.16	2.19	2.22	2.26	2.30	2.33	2.36	2.41	2.48	2.57	2.66	2.77

Joist Spacing

- Round the overhang bracket spacing, S, up to the nearest allowable joist span length in Table 3.
- Use this span length in Table 3 to determine the required joist spacing and size.
- If a particular joist spacing and size is desired, then obtain the allowable span length from Table 3 and confirm that value is greater than S

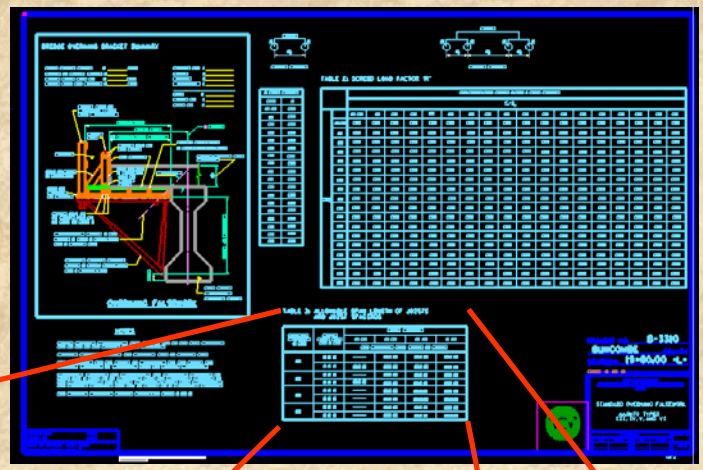
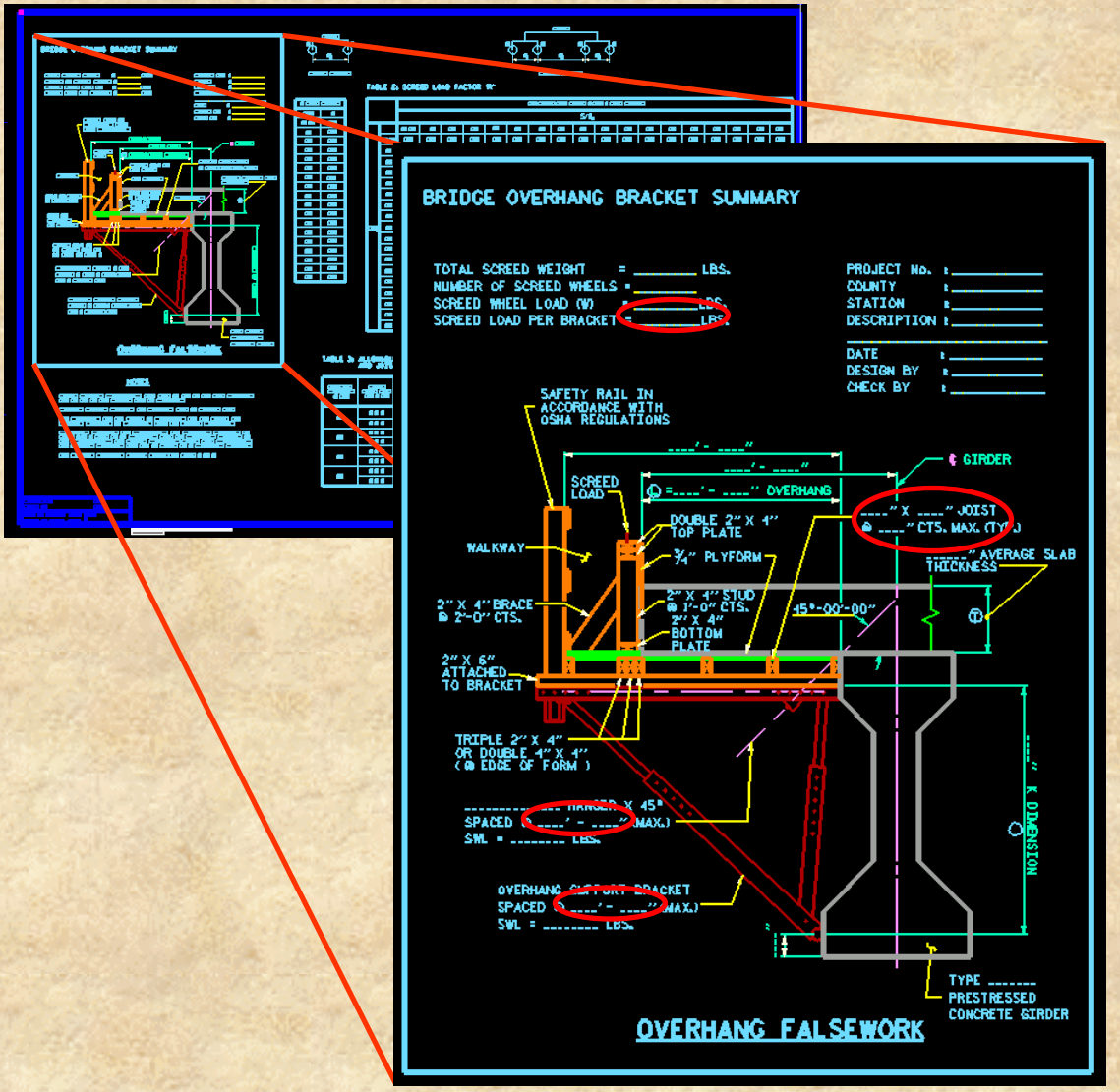


TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS Ⓣ (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	———	4′ - 6″	4′ - 9″	5′ - 0″
	4 X 4	5′ - 9″	6′ - 3″	6′ - 6″	6′ - 7″
12	2 X 4		4′ - 3″	4′ - 9″	5′ - 0″
	4 X 4	5′ - 3″	6′ - 0″	6′ - 3″	6′ - 5″
14	2 X 4	———	4′ - 0″	4′ - 6″	5′ - 0″
	4 X 4	———	5′ - 6″	6′ - 0″	6′ - 4″
16	2 X 4	———	4′ - 0″	4′ - 3″	4′ - 9″
	4 X 4	———	5′ - 3″	5′ - 9″	6′ - 3″

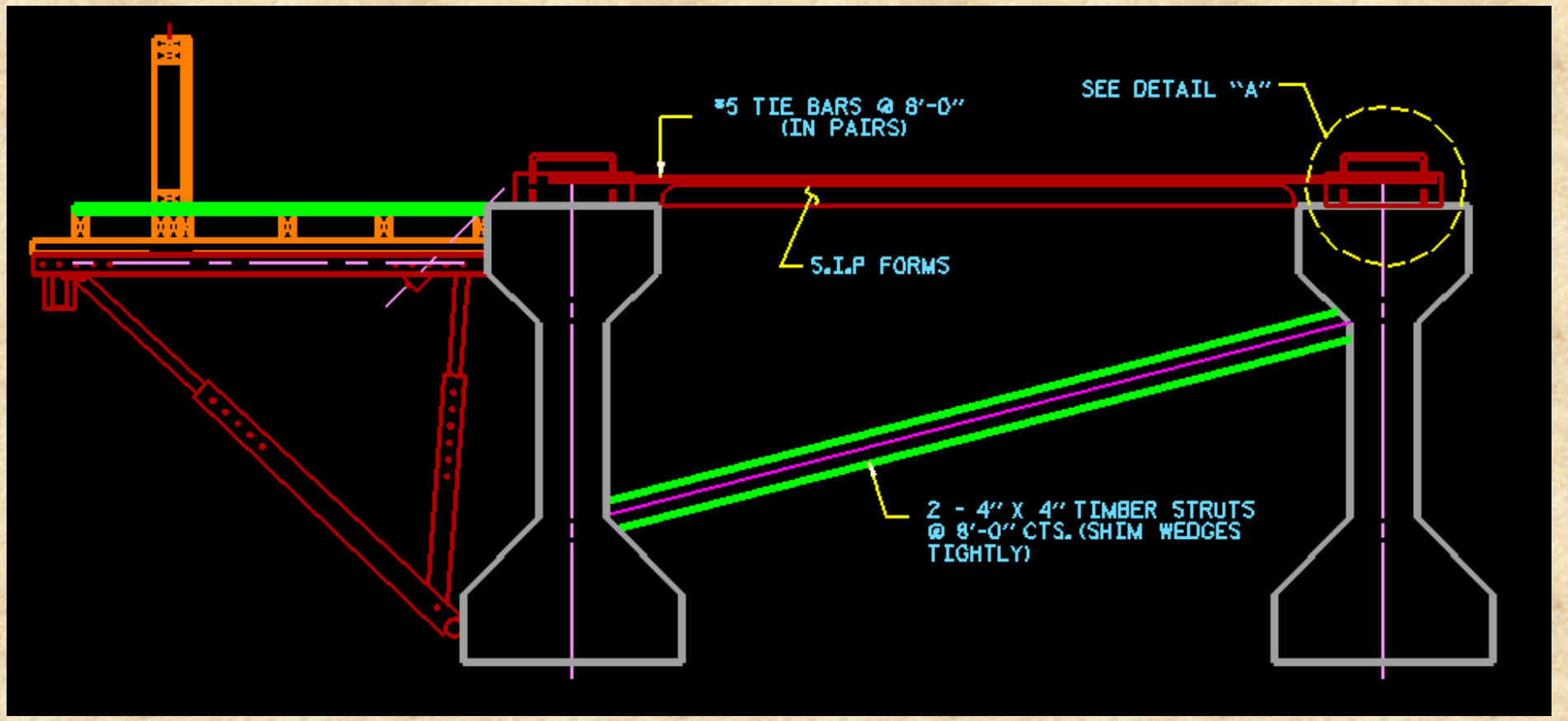
Design Summary



- Record the remainder of the information on the on the overhang falsework summary sheet.

Timber Struts

- Determine strut and tie bar spacing and record the required spacing on the form on Sheet 3.



Submittal

- Submit the two completed summary forms on Sheets 1 and 3 to the Structure Design Unit.
- The summary forms are available in PDF format. The required information may be typed directly on to the forms.
- Electronic submittals are encouraged.